THE CONSERVATION OF ELECTRICITY.

The following is from the preface to "Elementary Lessons in Electricity and Magnetism," by SILVANUS P. THOMPSON, now in the press.

"The theory of electricity adopted throughout is that electricity, whatever its nature, is *one*, not *two*. That this electricity, whatever it may prove to be, is not *matter*, and *energy*; that it resembles both matter and energy in one respect, however, in that it can neither be created nor destroyed. The doctrine of the *Conservation of Matter*, established a century ago by Lavoisier, teaches us that we can never destroy nor create matter, though we can alter its distribution and its forms and combinations in innumerable ways. The doctrine of the *Conservation of Energy* which has been built up by Helmholtz, Thomson, Joule, and Mayer during the last half century teaches us that we can neither create nor destroy energy, though we may change it from one form to another, causing it to appear as the energy of moving bodies, as the energy of heat, or as the static energy of a body which has been lifted against gravity or some other attracting force into a position whence it can run down, and where it has the potentiality of doing work. So, also, the doctrine of the *Conservation of Electricity*, which now is growing into shape, but here first enunciated under this name, teaches us that we can neither create nor destroy electricity, though we may alter its distribution—may make *more* to appear at one place and *less* at another—may change it from the condition of rest to that of motion, or may cause it to spin round in whirlpools or vortices which themselves can attract or repel other vortices. According to this view all our electrical machines and batteries are merely instruments for altering the distribution of electricity by moving some of it from one place to another, or for causing electricity when heaped up in one place to do work in returning to its former level distribution. Throughout these lessons the attempt has been made to state the facts of the science in language consonant with this view; but rather to lead the young student to this as the result of his study than to insist upon it dogmatically at the outset.'

A WATER CARRYING TORTOISE.

At a meeting of the Academy of Sciences the other evening, a very fine specimen of the desert land tortoise, from Cajon Pass, San Bernardino county, California, was received. The specimen had been carefully prepared, and was as large as an ordinary bucket. The tortoise is a native of the arid region of California and Arizona, and Prof. E. T. Cox, who was present, related a curious circumstance connected with it.

He found on dissecting one of them that it carried on each side a membrane, attached to the inner portion of the shell, in which was about a pint of clear water, the whole amount being about a quart. He was of the opinion that this water was derived from the secretions of the giant barrel cactus, on which the tortoise feeds. This cactus contains a great deal of water.

The tortoise is found in sections of country where there is no water, and where there is no vegetation but the cactus. A traveler suffering from thirst could, in an emergency, supply himself with water by killing a tortoise. They are highly prized by Mexicans, who make from them a delicious soup. The foxes of the desert attack the tortoise and finally overcome them by dragging them at times for miles.

B. B. Redding said he would try to obtain a live one for the Academy in order that its habits and peculiarities may be carefully observed and noted. He instanced being on the Gallapagos islands in 1849 and assisting in the capture of 92 land tortoises, varying from 450 to 600 lbs. in weight, which the vessel brought to San Francisco and sold for more money than the whole cargo of lumber netted at that time. They were two months on board the vessel, yet ate nothing and those killed had in them considerable quantities of pure water. They live on the high lava rocks, which rise as mountains on the island, where there are no springs or streams, and the only dependence of animal life for water is necessarily upon the irregular and uncertain rain showers.

It may be mentioned that the tortoise are of different species, though they may have the same habit in respect of carrying water. The famous edible species of the coasts of the Pacific and Indies, of which the headquarters is at Gallapagos islands, is the *Testudo Indica*. They grow to five, six, and even seven hundred pounds or more. Those found in this State are smaller and are the *Agassii* species first described some years ago by Dr. J. G. Cooper, if we recollect aright. Those Mr. Redding describes from the Gallapagos were offered water while on the ship but refused it. Yet when killed they all contained water. The place they inhabit is a dry one, lacking water. It may be that they go to the high places and obtain it from the vegetation, the same as our species does.

DALTONISM.—A Belgian Commission is making investigations on Daltonism. Their method of procedure is as follows:—On a table exposed to the bright sunlight are placed skeins of wool varying in color. The subject under examination is given, for example, a green colored one and he is told to select another of the same color. If he does so without hesitation, he is not affected with Daltonism, but he is still subjected to other trials, as for instance, the observation of colored signals at a distance. This ap plies especially to those employed on railways.

NEW RECORDING APPARATUS OF MOVEMENTS.—About twenty years ago M. Marey proposed to inscribe the different movements of living animals by means of a lever, as light as possible, and protected from every cause tending to set it in vibration, Since this epoch a considerable number of operations have been accomplished by the aid of this instrument; thus, the phenomena of the circulation of the blood, of respiration and of the movements of the heart have, in the employment of this method, been conclusively solved. Nevertheless one objection has been raised against these instruments: in the sometimes excedingly complicated tracings of physiological acts, the proper movements of the lever have increased the real curve of the movement which is to be inscribed. M. Marey has therefore invented and presented to the Academy a new inscriptic apparatus, the lever being reduced, which gives microscopic inscriptions, and thus can inscribe rapid movements with the greatest precision. The tracings of this instrument, which may be produced by the vibrations of the voice, or by the breath, are afterwards enlarged by projection and reduced to the necessary size. The microscopic inscription given by the new apparatus extends to an almost indefinite degree phenomena susceptible of registration.

FLUORESCENT SUBSTANCES.

SUBSTANCE.	By transmitted light.	Fluoresces.
Magdala red.....	Red	Red
Induline (acid sol.).....	Dirty green	Red
Nigrosine (acid sol.).....	Dirty green	Red
Tri-sulpho-acid of induline....	Blue	Red
Resorcin (di-azo compound)*..	Yellow	Vermilion
Resorcin (di-azo compound)*..	Violet red	Vermilion
Resorcin (di-azo compound)...	Green	Dark red
Resorcin (phthalic acid compound)*	Yellow	Green
Resorcin (phthalic acid and bromine compound).....	Red	Green
Amido-phthalic acid.....	Colorless	Green
Murexide (di-azo compound)..	Yellow	Green
Beta-naphthole.....	Brown	Blue
Naphthalamine*....	Colorless	Violet-blue

The four marked * are the best for exhibition purposes, the last surpassing sulphate of quinine. The fluorescence of the di-azo resorcin compound in direct sunlight shows a fluorescence not inferior to vermilion paint in brilliancy.

SIDNEY JEWSBURY.